

U.S. Patent Application Serial No. 10/561,963
Response to OA dated February 20, 2009

REMARKS

Claims 1 and 2 have now been cancelled and Claims 9 and 11 have been amended to clarify the invention. No new matter is involved.

Independent Claim 9, as amended, is to a scroll compressor in which a scroll fixed lap rising from a fixed plate of a fixed scroll and a scroll orbiting lap rising from an orbiting plate of an orbiting scroll are combined with each other to form compression chambers therebetween. A plate back surface of the orbiting scroll is provided with a back pressure space, the back pressure space is divided into an inner region and an outer region by a seal ring, high pressure is applied to the inner region of the seal ring, and pressure which is lower than that applied to the inner region is applied to the outer region, thereby bringing the orbiting scroll into contact with the fixed scroll. A rotation-resistant part restrains the orbiting scroll from rotating, the orbiting scroll is allowed to orbit, thereby moving the compression chamber toward a center of scroll while reducing volume of the compression chamber, and refrigerant gas is sucked into the compression chamber and compressed. The fixed scroll is made of iron-based material, the orbiting scroll is made of aluminum-based material, only the plate back surface of the orbiting scroll is subjected to surface processing to form a hardened layer, and the sliding portion between the plate back surface and the seal ring is masked and subjected to the surface processing, so as to provide reduced friction between the seal ring and the plate back surface, thereby not forming the hardened layer on the sliding portion between the back plate surface and the seal ring. Independent Claim 11, as amended, is to a scroll compressor in which a scroll fixed lap rising from a fixed plate of a fixed scroll and a scroll orbiting lap rising

U.S. Patent Application Serial No. **10/561,963**
Response to OA dated February 20, 2009

from an orbiting plate of an orbiting scroll are combined with each other to form compression chambers therebetween. A plate back surface of the orbiting scroll is provided with a back pressure space, the back pressure space is divided into an inner region and an outer region by a seal ring, high pressure is applied to the inner region of the seal ring, and pressure which is lower than that applied to the inner region is applied to the outer region, thereby bringing the orbiting scroll into contact with the fixed scroll. A rotation-resistant part restrains the orbiting scroll from rotating, the orbiting scroll is allowed to orbit, thereby moving the compression chamber toward a center of scroll while reducing volume of the compression chamber, and refrigerant gas is sucked into the compression chamber and compressed. The fixed scroll is made of iron-based material, the orbiting scroll is made of aluminum-based material, only the plate back surface of the orbiting scroll is subjected to surface processing to form a hardened layer, and the hardened layer formed by the surface processing of the sliding portion between the plate back surface and the seal ring is removed by working, so as to provide reduced friction between the seal ring and the plate back surface.

In the Office Action, Claims 1, 2, 9, 10, 11 and 12 were rejected as obvious under 35 U.S.C. 103(a) in view of APA, combined with Kitano (U.S. 6,116,876) and Yanada (U.S. 5,468,130).

Claims 1 and 2 have been canceled. Reconsideration and removal of the rejection of Claims 9-12 are respectfully requested in view of the present amendments to the claims and the following remarks.

The Office Action asserts that APA shows a comparable scroll compressor, except that it does not disclose subjecting only the back plate surface of the orbiting scroll to the surface

U.S. Patent Application Serial No. 10/561,963
Response to OA dated February 20, 2009

processing treatment.

Kitano is then cited to show that it is conventional to subject only the back plate surface of an orbiting scroll (18) to surface processing and it is alleged that it would be obvious to have utilized only the plate surface of the orbiting scroll being subjected to surface processing, as taught by Kitano in the APA apparatus.

It is also asserted that the modified APA fails to disclose a sliding portion between the plate back surface and the seal ring being subjected to lapping processing, buff processing or barrel polishing processing after the surface processing, a sliding portion between the plate back surface and the seal ring being masked and subjected to surface processing, and a sliding portion between the plate back surface and the seal ring removed by working.

The Office Action asserts that Kitano teaches that it is conventional in the art that only the plate back surface of the orbiting scroll (18) is subjected to surface processing and that it would have been obvious to one having ordinary skill in the art to have utilized only the plate surface of the orbiting scroll being subjected to surface processing, as taught by Kitano in the APA apparatus, since the use thereof would have reduced the wear amount, improved the performance and efficiency of the scroll compressor device.

Applicants would point out that even if it were conventional in the art that only the plate back surface of the orbiting scroll (18) is subjected to surface processing, the present invention has the technical feature not only that "only the plate back surface of the orbiting scroll (18) is subjected to surface processing to form a hardened layer", but also that "the sliding portion (reference number

U.S. Patent Application Serial No. 10/561,963
Response to OA dated February 20, 2009

(16) of FIG. 2) between said plate back surface and the seal ring is not formed and/or removed the hardened layer”.

As described above, the present Claims 9 and 11 are amended to specify that only the plate back surface of the orbiting scroll (18) is subjected to surface processing to form a hardened layer, but the sliding portion (reference number (16) of FIG. 2) between said plate back surface and the seal ring is not formed with the hardened layer, and the product of the invention is not only made by a different process, but is also different in structure from that of Kitano and the associated references.

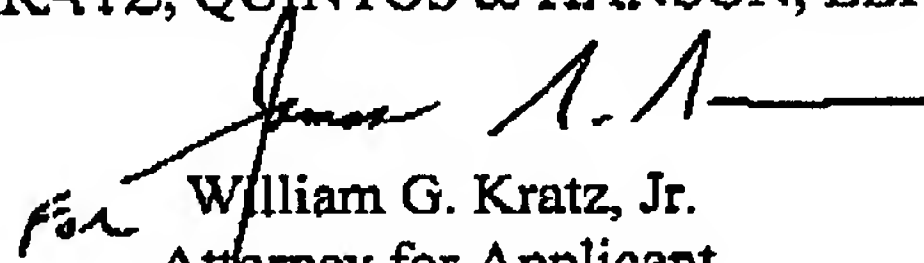
In view of the aforementioned amendments and accompanying remarks, Claims 9-12, as amended, are believed to be patentable and in condition for allowance, which action, at an early date, is requested.

U.S. Patent Application Serial No. 10/561,963
Response to OA dated February 20, 2009

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

KRATZ, QUINTOS & HANSON, LLP

For  4-0, 899
William G. Kratz, Jr.
Attorney for Applicant
Reg. No. 22,631

WGK/ak

Atty. Docket No. 050841
Suite 400
1420 K Street, N.W.
Washington, D.C. 20005
(202) 659-2930



23850

PATENT & TRADE MARK OFFICE